**ADIKAVI NANNAYA UNIVERSITY: RAJMAHENDRAVARAM**

**Single Major B.Sc Computer Science (w.e.f:2023-24A.B)**

**V Semester**

**Course 15 B : Application Development using Python**

**Credits -3**

**Learning Objectives:**

To enable students to develop IoT solutions for real-world problems

**Learning Outcomes:** On successful completion of the course, students will be able to

1. Examine Python syntax and semantics and be fluent in the use of Python flow control and

functions.

2. Demonstrate proficiency in handling Strings and File Systems.

3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries

and use Regular Expressions.

4. Interpret the concepts of Web Programming and GUI in Python

5. Apply concepts of Python programming in various fields related to IOT, Web Services and

Databases in Python.

UNIT-I

**Python basics, Objects**- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types

**Numbers** - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules

**Sequences** - Strings, Lists, and Tuples, Dictionaries and Set Types Control Flow, Truthiness, Sorting, List Comprehensions, Generators and Iterators

UNIT-II

**Files:** File Objects, File Built-in Function [ open() ], File Built-in Methods, File Built-in Attributes,

Standard Files, Command-line Arguments, File System, File Execution

**Exceptions:** Exceptions in Python, Detecting and Handling Exceptions, Context Management,

Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions,

Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related modules

**Modules:** Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT-III

**Regular Expressions:** Introduction, Special Symbols and Characters, Res and pythonMultithreaded

**Programming:** Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT-IV

**GUI Programming**: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs,

Related Modules and Other GUIs

**Web Programming**: Introduction, Wed Surfing with Python, Creating Simple Web Clients,

Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application,

Advanced CGI, Web (HTTP) Servers

UNIT-V

**Database Programming**: Introduction, Python Database Application Programmer’s Interface

(DBAPI), Object Relational Managers (ORMs), Related Modules

**Text Book(s)**

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

2. Think Python, Allen Downey, Green Tea Press.

Reference Books

1. Introduction to Python, Kenneth A. Lambert, Cengage.

2. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.

3. Learning Python, Mark Lutz, O’ Really.

**SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:**

Unit 1: Activity: Hands-on Lab exercise on Python Control Statements

Evaluation Method: Lab Performance and Correctness ofsolution Implementation

Unit 2: Activity: Assignment of Files in Python

Evaluation Method: Problem Solving, Accuracy

Unit 3: Activity: Exercises on Regular expressions

Evaluation Method: Solutions, Accuracy of Validation

Unit 4: Activity: Poster Presentation on various GUI components in Python

Evaluation Method: Content knowledge, organization, clarity, presentation skills, visualaids.

Unit 5: Activity: Group Project

Evaluation Method: Project effectiveness, User interface, Solution to the Problem